

FORAGE SUITABILITY GROUP SUBIRRIGATED

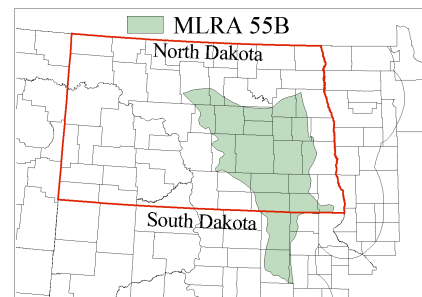
FSG No.: G055BY700ND

Major Land Resource Area: 55B - Central Black Glaciated Plains

Physiographic Features

The soils in this group are found on level and nearly level glacial lake, outwash, till, and flood plains, and on terraces and interbeach areas. They can also occur in swales and depressions of upland areas.

| | <u>Minimum</u> | <u>Maximum</u> |
|--------------------------|----------------|----------------|
| Elevation (feet): | 980 | 1970 |
| Slope (percent): | 0 | 6 |
| Flooding: | | |
| Frequency: | None | Frequent |
| Duration: | None | Brief |
| Ponding: | | |
| Depth (inches): | | |
| Frequency: | None | None |
| Duration: | None | None |
| Runoff Class: | Very low | High |



Climatic Features

This group occurs in a mid-continental climate characterized by wide seasonal temperature and precipitation fluctuations and extremes.

Annual precipitation varies widely from year to year in MLRA 55B. Average annual precipitation for all climate stations listed below is about 19 inches. About 78 percent of that occurs during the months of April through September. On average, there are about 28 days with greater than .1 inches of precipitation during the same timeframe. Precipitation is lowest in the north west and highest in the south in the MLRA. Precipitation is less than needed for optimum forage production and is the single largest factor limiting production from this group on non-irrigated lands.

Average annual snowfall ranges from 25 inches at Forman, North Dakota (ND,) to 37 inches at Columbia, South Dakota (SD). Snow cover at depths greater than 1 inch range from 32 days at Petersburg, ND to 98 days at Gackle, ND.

Average July temperatures are about 71°F and average January temperatures are about 7°F. Recorded temperature extremes in the MLRA during the years 1961 to 1990 are a low of -39 at both Petersburg and Oakes in ND, and a high of 114 recorded at Mellette, SD. The MLRA lies in USDA Plant Hardiness Zones 3b and 4a.

At Aberdeen, SD, the average annual wind speeds are about 11 mph. The highest wind speeds occur during March through May, but average monthly wind speeds do not vary significantly throughout the year. It is cloudy about 163 days a year. Average morning relative humidity in June is about 85 percent and average afternoon humidity is 60 percent.

The climate data listed in the tables below represent high and low ranges and averages for the climate stations and dates listed. For additional climate data, access the National Water and Climate Center at <http://www.wcc.nrcs.usda.gov>.

| | From | To |
|---|-------------|-----------|
| Freeze-free period (28 deg)(days): (9 years in 10 at least) | 115 | 137 |
| Last Killing Freeze in Spring (28 deg): (1 year in 10 later than) | May 28 | May 14 |
| Last Frost in Spring (32 deg): (1 year in 10 later than) | Jun 06 | May 23 |
| First Frost in Fall (32 deg): (1 year in 10 earlier than) | Aug 29 | Sep 10 |

| | From Sep 08 | To Sep 21 |
|--|-----------------------|---------------------|
| First Killing Freeze in Fall (28 deg): (1 year in 10 earlier than) | | |
| Length of Growing Season (32 deg)(days): (9 years in 10 at least) | 92 | 116 |
| Growing Degree Days (40 deg): | 3389 | 4402 |
| Growing Degree Days (50 deg): | 1852 | 2558 |
| Annual Minimum Temperature: | -35 | -25 |
| Mean annual precipitation (inches): | 16 | 21 |

Monthly precipitation (inches) and temperature (F):

| | | | | | | | | | | | | |
|--------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 2 years in 10: | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| Precip. Less Than | 0.24 | 0.13 | 0.30 | 0.63 | 1.08 | 1.72 | 1.30 | 0.94 | 0.76 | 0.23 | 0.18 | 0.24 |
| Precip. More Than | 0.60 | 0.79 | 2.10 | 3.58 | 4.09 | 5.07 | 3.66 | 4.02 | 3.07 | 1.92 | 1.14 | 0.74 |
| Monthly Average: | 0.50 | 0.43 | 1.02 | 1.89 | 2.41 | 3.39 | 2.65 | 2.27 | 1.94 | 1.18 | 0.57 | 0.46 |
| Temp. Min. | -8.2 | -2.7 | 11.6 | 28.1 | 39.9 | 50.0 | 54.0 | 51.2 | 40.8 | 30.3 | 15.0 | -2.0 |
| Temp. Max. | 21.8 | 28.2 | 41.0 | 58.2 | 70.9 | 80.0 | 87.3 | 85.5 | 74.0 | 61.5 | 42.1 | 26.2 |
| Temp. Avg. | 7.4 | 13.6 | 26.9 | 42.8 | 55.7 | 65.4 | 71.0 | 68.7 | 57.6 | 45.8 | 28.3 | 12.9 |

| Climate Station | Location | From | To |
|------------------------|-----------------|-------------|-----------|
| ND2482 | Edgeley, ND | 1961 | 1990 |
| ND2605 | Oaks, ND | 1961 | 1987 |
| ND2605 | Ellendale, ND | 1961 | 1987 |
| ND2949 | Fessenden, ND | 1961 | 1990 |
| ND3117 | Forman, ND | 1961 | 1990 |
| ND3287 | Fullerton, ND | 1961 | 1990 |
| ND3309 | Gackle, ND | 1961 | 1990 |
| ND4343 | Hurdsfield, ND | 1961 | 1990 |
| ND4413 | Jamestown, ND | 1961 | 1990 |
| ND4937 | La Moure, ND | 1961 | 1990 |
| ND5764 | McVile, ND | 1961 | 1990 |
| ND7027 | Petersburg, ND | 1961 | 1990 |
| ND8937 | Valley City, ND | 1961 | 1990 |
| SD0020 | Aberdeen, SD | 1961 | 1990 |
| SD1873 | Columbia, SD | 1961 | 1990 |
| SD5456 | Mellette, SD | 1961 | 1990 |

Soil Interpretations

The soils in this group are moderately fine to coarse textured and mostly somewhat poorly drained. They have a seasonal water table within 18 to 48 inches of the surface during part of the growing season.

| | | | |
|---|-------------------------|----|-------------------------|
| Drainage Class: | Somewhat poorly drained | To | Moderately well drained |
| Permeability Class: (0 - 40 inches) | Moderately slow | To | Rapid |
| Frost Action Class: | Moderate | To | High |

| | <u>Minimum</u> | <u>Maximum</u> |
|---|-----------------------|-----------------------|
| Depth: | 72 | |
| Surface Fragments >3" (% Cover): | 0 | 3 |
| Organic Matter (percent): (surface layer) | 1.0 | 13.0 |
| Electrical Conductivity (mmhos/cm): (0 - 24 inches) | 0 | 8 |
| Sodium Absorption Ratio: (0 - 12 inches) | 0 | 3 |

| | <u>Minimum</u> | <u>Maximum</u> |
|---|----------------|----------------|
| Soil Reaction (1:1) Water (pH): (0 - 12 inches) | 6.1 | 9 |
| Available Water Capacity (inches): (0 - 60 inches) | 3 | |
| Calcium Carbonate Equivalent (percent): (0 - 12 inches) | 0 | 30 |

Adapted Species List

The following forage species are considered adapted to grow on the soils in this group. Additional information concerning plant characteristics of a number of the listed species as well as individual cultivars of many of those species can be accessed on the web at <http://plants.usda.gov/>.

Cool Season Grasses

| | |
|-------------------------|---|
| Altai wildrye | F |
| Canada wildrye | F |
| Creeping foxtail | F |
| Dahurian wildrye | F |
| Green needlegrass | F |
| Intermediate wheatgrass | F |
| Meadow brome | G |
| Newhy hybrid wheatgrass | G |
| Pubescent wheatgrass | F |
| Reed canarygrass | G |
| Slender wheatgrass | G |
| Smooth brome | G |
| Tall wheatgrass | G |
| Western wheatgrass | G |

Warm Season Grasses

| | |
|-----------------|---|
| Big bluestem | G |
| Indiangrass | G |
| Little bluestem | G |
| Switchgrass | G |

Legumes

| | |
|-------------------|---|
| Alfalfa | F |
| Alsike clover | F |
| Birdsfoot trefoil | G |
| Canada milkvetch | F |
| Cicer milkvetch | F |
| Hairy vetch | F |
| Sweetclover | F |
| White clover | F |

G - Good adaptation for forage production on this group of soils in this MLRA

F - Fair adaptation but will not produce at its highest potential

Production Estimates

Production estimates listed here should only be used for making general management recommendations. Onsite production information should always be used for making detailed planning and management recommendations.

The high forage production estimates listed below are based on dense, vigorous stands of climatically adapted, superior performing cultivars. They are properly fertilized for high yields, and pest infestations are kept below economic thresholds. Mechanical harvests are managed to maintain stand life by cutting at appropriate stages of maturity and harvest intervals. If grazed, optimum beginning and ending grazing heights are adhered to. Adequate time is allowed for plant recovery before entering winter dormancy under both uses.

The production estimates listed below represent total annual above ground plant production on an air-dry-matter basis. Estimates of hay and grazing yields can be calculated from these numbers by multiplying them by a harvest efficiency. A 70 percent harvest efficiency is commonly used when converting to hay yields. Pasture harvest efficiency is highly dependent on the grazing management system applied, ranging from 25 to 50 percent.

Forage Crop

Management Intensity

| | <u>High</u> (lbs/ac) | <u>Low</u> (lbs/ac) |
|---------------------------------|-------------------------|------------------------|
| Alfalfa | 9400 | 4600 |
| Alfalfa/Intermediate wheatgrass | 8300 | 4000 |
| Alfalfa/Smooth brome | 8300 | 4000 |
| Big bluestem | 8000 | 4000 |
| Creeping foxtail | 7400 | 4300 |
| Indiangrass | 6200 | 3400 |
| Intermediate wheatgrass | 7700 | 3100 |
| Reed canarygrass | 10300 | 6000 |
| Smooth brome | 7700 | 3100 |
| Switchgrass | 9700 | 4300 |

Forage Growth Curves

Growth curves estimate the seasonal distribution of growth of the various forage crops. They indicate when the forages may be available for grazing or mechanical harvest.

Growth Curve Number: ND0001

Growth Curve Name: Alfalfa

Growth Curve Description: Alfalfa

Percent Production by Month

| <u>Jan</u> | <u>Feb</u> | <u>Mar</u> | <u>Apr</u> | <u>May</u> | <u>Jun</u> | <u>Jul</u> | <u>Aug</u> | <u>Sep</u> | <u>Oct</u> | <u>Nov</u> | <u>Dec</u> |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 0 | 0 | 0 | 5 | 25 | 30 | 20 | 15 | 5 | 0 | 0 | 0 |

Growth Curve Number: ND0002

Growth Curve Name: Cool season grass

Growth Curve Description: Cool season grass

Percent Production by Month

| <u>Jan</u> | <u>Feb</u> | <u>Mar</u> | <u>Apr</u> | <u>May</u> | <u>Jun</u> | <u>Jul</u> | <u>Aug</u> | <u>Sep</u> | <u>Oct</u> | <u>Nov</u> | <u>Dec</u> |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 0 | 0 | 0 | 5 | 40 | 35 | 10 | 5 | 5 | 0 | 0 | 0 |

Growth Curve Number: ND0003

Growth Curve Name: Warm season grass

Growth Curve Description: Warm season grass

Percent Production by Month

| <u>Jan</u> | <u>Feb</u> | <u>Mar</u> | <u>Apr</u> | <u>May</u> | <u>Jun</u> | <u>Jul</u> | <u>Aug</u> | <u>Sep</u> | <u>Oct</u> | <u>Nov</u> | <u>Dec</u> |
|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 0 | 0 | 0 | 0 | 10 | 40 | 35 | 15 | 0 | 0 | 0 | 0 |

Soil Limitations

These soils have few limitations to the production of climatically adapted forage crops, and production potential is high. Forage species like alfalfa that are less tolerant of saturated soils for extended periods of time may suffer stand loss during wet years when water tables stay abnormally high. Due to the dominant upward movement of water these soils may become saline. A number of them have a high lime content near the surface which reduces the availability of some plant nutrients. These soils are also subject to compaction if grazed or machinery is operated on them when wet. Coarser textured soils in this group may be subject to soil blowing when establishing new stands.

Management Interpretations

When establishing new stands select species that are tolerant of somewhat poorly drained, occasionally saturated soils and that are also capable of utilizing the additional moisture inherent to these soils. Excluding livestock and machinery during extended periods of soil wetness will help reduce soil compaction. On coarser textured soils, incorporate wind erosion control practices during stand establishment.

Pasture and hayland can include considerations for wildlife. Delaying grazing on portions of the pasture or rotating pastures will allow nest initiation of grassland nesting birds or species of concern. Nest initiation of most grassland nesting birds occurs from April 15 to June 1. Delaying haying until after July 15 allows for most species to fledge their young. Consider planting species with later maturity to allow for harvesting after nests have fledged. Avoid mowing around the field. Mow back and forth or from the inside to the outside of the field. Consider using flushing bars on swathers and mowers.

FSG Documentation

Similar FSGs:

FSG ID

G055BY500ND

FSG Narrative

Overflow soils do not have water tables within 18-48 inches of the surface during part of the growing season.

Inventory Data References

Agriculture Handbook 296-Land Resource Regions and Major Land Resource Areas
Natural Resources Conservation Service (NRCS) National Water and Climate Center data
USDA Plant Hardiness Zone maps
National Soil Survey Information System (NASIS) for soil surveys in North Dakota and South Dakota counties in MLRA 55B
North Dakota and South Dakota NRCS Field Office Technical Guide
NRCS National Range and Pasture Handbook
Various Agricultural Research Service, Cooperative Extension Service, and NRCS research trials for plant adaptation and production.

State Correlation

This site has been correlated with the following states: North Dakota and South Dakota

Forage Suitability Group Approval

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